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AUTHOR Jackson, Linda W.; And Others
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ABSTRACT

Using word processors and the traditional handwriting method, a study investigated the relationship of learning styles to performance in twelfth graders' written compositions. Subjects (n=55) were enrolled in a public school in east central Mississippi. The study hypothesized that students using word processors and those using the traditional handwritten method would demonstrate no significant difference in either achievement or learning styles. Canfield Learning Style Inventory measured learning style, while a Mechanics of Writing Checklist measured writing performance. Data analysis indicated no significant difference between the two groups' achievement. Three learning style preferences contributed significantly to the word processing groups' achievement: organization, inanimate objects, and direct experience. The handwriting group preferred independence in their work, learned qualitatively, and expected grades of "C" in their work. Analysis of the relationship of learning styles to achievement indicated that the learning style of the handwriting group was more qualitative than that of its word processing counterpart. Results indicated that the use of word processors did not (1) affect the written composition of twelfth graders, (2) correlate with achievement, and (3) relate to learning style and achievement. (Tables of data are included and the Mechanics of Writing Checklist is appended.) (JD)

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RELATING LEARNING STYLES TO PERFORMANCE ON WRITTEN COMPOSITION USING MICROCOMPUTER WORD PROCESSING AND THE TRADITIONAL HANDWRITTEN METHOD

Authors: Linda W. Jackson
Kemper County Public Schools
DeKalb, Mississippi

Dr. Jane H. McHaney
Mississippi State University

Dr. Herbert M. Handley
Mississippi State University

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ABSTRACT

The purpose of this study was to determine the relationship of twelfth grade students' learning styles to their performance on written composition using a microcomputer word processor and the traditional handwritten method. Subjects for the study consisted of 55 students enrolled in the twelfth grade of a public school in East Central Mississippi. The students using word processing served as the experimental group, while students using the traditional handwritten method served as the control group. The Canfield Learning Style Inventory was administered to both groups. A Mechanics of Writing Checklist was used to obtain scores for the compositions. Grade point average was used to control initial differences in achievement. Differentials in correlations of achievement with grade point average and learning styles measures for students taught by the two methods were determined. Group differences in relationships between learning related variables and achievement were compared through Fisher r to z transformation. Analysis of data indicated no significant differences between achievement of the two groups. Learning style preference correlated significantly with achievement within groups.

Relating Learning Styles to Performance on Written Composition Using Microcomputer Word Processing and the Traditional Handwritten Method

Introduction

The ability of students to create a unified impression in writing for composition classes or other curriculum areas requiring writing skills has declined in recent years. In response to this growing concern, American high schools, colleges, and universities are implementing methods to improve the way composition is taught.

With computers entering schools and homes in large numbers today, one method being utilized to enhance the way written composition is being taught is through computer-assisted instruction and word processing. According to a report by Enoch, Handley, and Wollenberg (1984), when used effectively, computer-assisted instruction can be motivating and provide stimuli on an individual basis inciting students to spend more time on a task than traditional methods of instruction.

A factor that may affect student performance with a method of instruction is learning style. Dunn (1982) states every individual has a learning style and that style determines how well the individual absorbs and retains new and difficult concepts. This study will attempt to determine the relationship of learning styles to performance on written composition using word processing and the pencil-paper method.

Review of the Literature

Research into the effect of word processing on teaching writing has

only recently begun. Yet studies that have been conducted found the word processor to be a powerful tool for use in teaching composition. The word processor can not replace the teacher, for neither textbook or machine can teach writing effectively without the guidance of an individual. There exists a gap between knowing what the principles of writing are and how to put these principles to use in a productive manner (Gula, 1983; Risken, 1972).

The word processor can compliment the teacher. The benefits derived from its use include improvement in style, productivity and process. In creative expression, fluency grows, flexibility develops, and originality surfaces (McKenzie, 1984).

Fisher (1983) states that revision is the most important step in writing. Students generally do not enjoy writing because of the time spent in preparing the final draft. With the traditional method, a student begins with a topic, an outline and proceeds to develop the topic by building supporting sentences and shaping good transition paragraphs. There is pressure to know in advance what should be written. To change ideas would require erasing, cross-outs, arrows drawn to additions or whatever editing technique the student might employ (McKenzie, 1984).

Word processing should encourage, rather than discourage, students to properly revise and edit their work. Bean (1983) states that although the computer cannot cure a student's psychological and cognitive blocks to revision, it can eliminate mechanical difficulties such as illegible handwriting and lack of time for recopying. Once this

is excluded, students do better with the composing processes. In an investigation by Gula (1983), the word processing method was found not to improve the quality of a student's thought, but it provided conditions that made it easier to think more clearly. Green (1984) reported that the student can experiment with writing styles when there are no erasures, cross-outs or recopying to be done. In a description given by Fisher (1983), editing is done through deletions, insertions, rewriting words, sentences or paragraphs and moving them from place to place by using appropriate computer commands. The editing shows up on the screen of the computer. If a printer is connected, a typed copy of the draft can be obtained for revision again, if needed. A diskette permits the student to save what he has begun to complete or add to it at another time.

Henningsa (1981) conducted a study on the use of word processing at the primary, elementary, and junior high levels and concluded the students become computer literate while they learn to write and edit. This experience paves the way for the future when they will need knowledge on how to put data in and get data out of the computer in addition to also understanding the capabilities of the technology.

At the high school level, research indicates students tend to stay longer with a piece of writing on the word processor than with paper and pencil and can better determine what changes or corrections are needed by seeing the composition on the screen. The students also become more aware of what happens intellectually as people write (Womble, 1984).

In a study of a college freshman English class, results showed the

use of word processing to be ideally suited for tutoring students in writing improvement. In the conclusions, the students were eager to polish up their writing and learn the conventions of editing. Texts were put on disks to make communication and feedback easier (Schwartz, 1984). Watt (1983) states that besides changing the way students learn to write by overcoming mechanical barriers, word processing makes writing physically easier for young children and people with physical or neurological handicaps.

With the advantages of word processing being noted by research studies, Halpern (1982) emphasizes the responsibility of teachers in preparing students to write well in preparation for the increasing number of jobs that will make use of composing and dictating with word processors. Montgomery (1975) suggested a curriculum be written to help develop the total concept of word processing and that emphasis be placed on spelling, grammar, punctuation, and editing skills presented by word processing programs. Although limited, findings in the literature review support the idea that word processing has a more positive effect on the writing skills of students than the traditional pencil and paper method.

Rather than the instructional method alone being the determinant for success in performance, Dunn, Dunn, and Price (1977) suggest how a student learns is related more to academic achievement. Instruments, such as learning style inventories, should be used to decide which method best fits the way a student should be taught before assignment to a particular group. Onyejiaku (1982) cites evidence that individuals

adopt certain styles to learning tasks and that if that style is known and put into instructional programs, potentialities would be maximized and the individual would learn more effectively.

Problem Statement

The problem in this study was to determine the relationship of twelfth grade students' learning styles to their performance on written composition using a microcomputer word processor and the traditional handwritten method.

Hypotheses

Based on the literature review, the following hypotheses were investigated:

1. There will be no significant difference in the achievement of twelfth grade students who use a word processing program and those who use the traditional method when quality point average is used as a covariate.
2. There will be no significant difference between learning style and achievement for students using word processing and those using the traditional method.
3. There will be no significant difference in the correlation between achievement and learning styles when the two groups are compared.

Operational Definitions

For the purpose of this study, the following definitions were used:

Word processor--A computer program that allows what a writer types

to appear on a viewing screen and provides an editing feature that enables the writer to type, edit, store, print and communicate the written word.

Traditional method--Composing a written composition with pen and paper with a typewritten final draft.

Written composition--The putting together of a topic using sentences to develop paragraphs that show unity in thought and expression.

Assumptions

For the purpose of this study, the following assumptions were made:

1. The motivation given by the teacher is assumed to be constant in both groups.
2. Topics chosen for compositions were of interest to students in both groups.
3. Evaluation of the compositions by the teachers were done without bias.

Limitation

The following limitation existed for this study: Students in the word processing group had had no previous experience with microcomputers.

Methodology

Subjects

The subjects in this study were 55 twelfth grade students enrolled in a public high school in East Central Mississippi. There were three

sections of the twelfth grade class with an average of 22 students in each section. The subjects were randomly assigned to two groups within each section by drawing their names from a "hat." There were nine to 12 subjects in each group. A coin was flipped to determine which group would be experimental and which group would be the control group. There were 26 males and 29 females in the sample. Each student was enrolled in a regular senior English class. The subjects were taught six weeks of computer literacy and word processing.

Procedure

Students using word processing were designated as Group One and those using the traditional method were designated as Group Two. Students were given eight topics from which to select one to write a one page composition. Students were given 55 minutes of class time for five days to compose, revise, type, and/or output their composition. Those students in Group One worked in the computer lab with a word processing program for three weeks prior to writing compositions. Students in Group Two remained in their regular classes.

The instruments used to gather data for this study were the Learning Styles Inventory and a Mechanics of Writing Checklist. The students' grade point averages were also collected from their cumulative records.

The Learning Style Inventory, developed by Albert Canfield in 1972, is currently being used in approximately 43 states and three foreign countries to measure some of the variables that affect learning. The inventory is published in two forms. Form E is designed for use with students with fifth grade reading levels and above. It was developed to

meet the needs of elementary and intermediate school students and any person with a lower grade reading ability. Form S-A is used with learners having at least ninth grade reading level. Both Form E and Form S-A are composed of 30 items. Form S-A was used in this study. Each item in the inventory requires the person to rank four options in the order in which they describe their preferences or feelings. The ranking method is used because it collects a large number of discriminatory judgments without excessive inventory length. The inventory is untimed and can be completed in about one minute per item. It focuses on the four major categories of conditions, content, mode, and expectations. The category of conditions measures motivational qualities in the areas of affiliation (peer and instructor), eminence (competition and authority), structure (organization and detail), and achievement (goal setting and independence). The mode category measures student preference for four different kinds of learning. These four learning modes are listening or auditory, reading, iconics, and direct experiences with subject matter. The content category measures major areas of interest in numeric, qualitative, inanimate and people divisions. The expectation category measures the level of performance anticipated by the student. Scale reliabilities in this instrument range from .59 to .92 (Canfield, 1980).

The Mechanics of Writing Checklist (see Appendix A) was used in an ESEA Title IV-C Research Project in the Louisville Municipal Separate School District. The checklist was developed by Dr. Grace Rockarts at the University of Alabama for the district. The project was conducted

to determine effective methods of teaching written composition to students in grades nine through 12. Compositions are rated on a scale from one to five, one being "poor", and five being "excellent." The 15 areas rated are: punctuation, capitalization, plurals, verb tense, spelling, run-on sentences, subject/verb agreement, pronoun reference, pronoun/antecedent agreement, sentence fragments, contractions, possessives, misplaced modifiers, diction, and narrowed subject. Compositions were scored according to the total points received.

Data Collecting Procedures

Access to students' cumulative records to obtain grade point averages was secured from the principal of the high school. The Learning Styles Inventory was administered to students in both groups during the last week they attended the computer lab in May, 1985. Compositions were rated by three senior English teachers. Title pages were removed so that the teachers would be unaware of whose paper was being graded.

Analysis of Data

The purpose of this study was to determine the relationship of twelfth grade students' learning styles to their performance on written composition using a microcomputer word processor and the traditional handwritten method.

Learning style was measured by the Canfield Learning Style Inventory. Performance on written composition was measured by a Mechanics of Writing Checklist developed for a ESES Title IV-C Research

Project. Achievement was measured by the twelfth grade students' grade point averages. All statistical data presented was processed at the Thomas E. Tramel Computer Center at Mississippi State University, Mississippi State, Mississippi.

An analysis of covariance was used for data analysis. The dependent variable used was the score from students' compositions. The independent variables were grade point average and the 20 separate analyses of learning styles which were peers, organization, goal setting, competition, instructor, detail, independence, authority, numeric, qualitative, inanimate, people, listening, reading, iconic, direct experiences, and expectations of A, B, C, and D.

Evaluation of Stated Hypotheses

Three null hypotheses were investigated in this study.

Hypothesis 1: It was hypothesized that there would be no significant difference in the achievement of twelfth grade students who use a word processing program and those who use the traditional method when grade point average was used as a covariate. Data testing this hypothesis are given in Table 1. When overall grade point average for students was used as a covariate (to control initial differences in achievement), an F ratio of only .02 was discovered. This value was far lower than the ratio required for significance at the .05 level ($F \geq 4.04$). Therefore, no significant difference was found between the achievement of the word processing group ($X = 39.41$) and the traditional group ($X = 40.25$). It was concluded that students did not achieve differently in the two groups when general achievement was controlled.

Table 1

Comparison of Achievement in Composition for Those Taught by Word Processing and Traditional Methods

Groups	Adjusted Means	F
Word Processing	39.41	
Traditional	40.25	
		.02*

*F $\geq$ 4.04 needed for significance at .05 level

Hypothesis 2: It was hypothesized that there would be no significant difference between learning style and achievement for students using word processing and those using the traditional method. These data are presented in Table 2. First, the subjects' ratings on the learning style inventory variables were correlated with achievement for the word processing group and the traditional group, respectively. From this analysis, it was found that three learning style preferences correlated significantly with achievement with the word processing groups. They were organization (-.36), inanimate objects (.34), and direct experiences (-.37). Hence, those who learned more in the group taught by word processing preferred to work with inanimate materials in learning and did not prefer organizational structures and direct experience for learning.

Achievement in the traditional group was enhanced more by students who preferred independence in their work (.34), who learned qualitatively (.48), and who expected a grade of "C" in their work (.32). In contrast, the traditional group did not prefer to learn by competition (-.41); they did not learn by authority (-.39); and, they were less numeric (-.30).

Hypothesis 3: It was hypothesized that there would be no significant difference in the correlation between learning style and achievement when the two groups were compared. A Fisher r to z transformation (Glass & Stanley, 1970) was made, and the difference in the correlations between achievement and learning styles for the two groups were compared. The .05 level of significance was used to determine

Table 2

Differences in Relationships Between Learning Styles and Achievement in English Composition for Word Processing Scores and Traditional Scores

Learning Styles	Word Processing r	Traditional r	z
Peers	.29	.23	.23
Organization	-.36*	-.14	.83
Goal Setting	.17	.28	-.41
Competition	-.09	-.41*	-1.21
Instructor	.17	.20	-.11
Detail	-.01	-.17	-.57
Independence	.09	.34	-.94
Authority	-.28	-.39*	-.43
Numeric	-.08	-.30*	-.81
Qualitative	-.17	.48*	2.43
Inanimate	.34*	-.02	1.23
People	-.15	-.13	.07
Listening	.11	-.05	.56
Reading	.25	.53	-1.17
Iconic	-.01	-.21	-.71
Direct Experiences	-.37*	-.27	.39
Expectations A	-.04	-.17	-.46

table continues

Learning Styles	Word Processing	Traditional	
	r	r	z
Expectations B	-.32	-.17	.56
Expectations C	.07	.32*	-.91
Expectations D	.26	.05	.75

*Significant at .05 level

differences. As shown in Table 2, the only difference found was in relationships concerning qualitative learning styles. Achievement in the traditional group was significantly correlated with this variable in the traditional group and negatively correlated in the word processing group. Those students who did better in the word processing group were not qualitative learners, whereas their counterparts in the traditional group were.

Summary

The purpose of this study was to determine the relationship of twelfth grade students' learning styles to their performance on written composition using a microcomputer word processor and the traditional handwritten method. The subjects were 55 senior English students enrolled in the 1984-85 school year in Kemper County, Mississippi.

There were three null hypotheses investigated. Hypothesis 1 concentrated on if there would be differences found in achievement of students that used the word processing method and those who used the traditional method. Analysis of data revealed no significant difference between the achievement of the two groups. Hypothesis 2 related to what correlation would be found between learning styles and achievement for students taught by the two methods. Three learning style preferences were found to contribute significantly with achievement with the word processing group. They were organization, inanimate objects, and direct experience. The traditional group preferred independence in their work, learned qualitatively, and expected grades of "C" for their work.

Hypothesis 3 focused on the relationship of learning styles to achievement between the two groups. A Fisher r to z transformation was used with a .05 level of significance. The only difference found was in the relationship pertaining to qualitative learning styles. The learning style of the word processing group was not as qualitative as its counterpart. Therefore, each of the null hypotheses were retained.

Conclusions

The results of this study appear to justify the following conclusions:

1. Word processing does not have an effect on the written composition of twelfth grade students.
2. Word processing does not appear to correlate with achievement.
3. Word processing does not appear to show a relationship between learning styles and achievement.

Implications

The results of this study supported findings of Onyejiaku (1982) and Dunn, Dunn, and Price (1977) which showed a significant relationship between achievement and learning style. However, it did not support the literature which denoted word processing would enhance students' performance on written composition when compared to the traditional method (Bean, 1983; Fisher, 1983; Green, 1984; Gula, 1983; Risken, 1972). The study did not substantiate the report by Enochs, Handley, and Wollenberg relating learning style and achievement with computer-assisted instruction, but supported the implication that if one method

is to be selected over another method of instruction, then it could be determined from the results of learning style inventories. Methods of instruction could be matched with the particular style or mode of learning that is indicative of the individual or group.

Recommendations

As a result of this study, the following recommendations are offered:

1. A longitudinal study be conducted comparing the use of word processing and the traditional method.
2. A larger sample be used to obtain more accurate results.
3. Use of a sample that has had a wider range of experience with microcomputers.

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APPENDIX A

Mechanics of Writing Checklist

Mechanics of Writing - Checklist

NAME _____ Date _____

	1	2	3	4	5
1. Punctuation	____	____	____	____	____
2. Capitalization	____	____	____	____	____
3. Plurals	____	____	____	____	____
4. Verb tense	____	____	____	____	____
5. Spelling	____	____	____	____	____
6. Run-on sentences	____	____	____	____	____
7. Subject/verb agreement	____	____	____	____	____
8. Pronoun reference	____	____	____	____	____
9. Pronoun/antecedent agreement	____	____	____	____	____
10. Sentence fragments	____	____	____	____	____
11. Contractions	____	____	____	____	____
12. Possessives	____	____	____	____	____
13. Misplaced modifiers	____	____	____	____	____
14. Diction	____	____	____	____	____
15. Narrowed subject	____	____	____	____	____

Check the blank beside each skill using the following scale:

1 = Poor 2 = Fair 3 = Average 4 = Above Average 5 = Excellent

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